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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,908	11/30/2004	Bill J. Pope	3772.DIMC.CN	7552
27472 7590 10/14/2009 BATEMAN IP LAW GROUP P.O. BOX 1319 SALT LAKE CITY, UT 84110				
EXAMINER				
BLANCO, JAVIER G				
ART UNIT		PAPER NUMBER		
3774				
MAIL DATE		DELIVERY MODE		
10/14/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/727,908

Applicant(s)

POPE ET AL.

Examiner

JAVIER G. BLANCO

Art Unit

3774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-66 is/are pending in the application.
- 4a) Of the above claim(s) 31, 46, 47, and 54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29, 30, 32-45, 48-53 and 55-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicants' amendment of claims 29, 35, 36, 38-40, 55-58, and 65 in the reply filed on June 13, 2008 is acknowledged.
2. Applicants' cancellation of claim 67 in the reply filed on June 13, 2008 is acknowledged.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 29-66 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7 and 8 of U.S. Patent No. **5,645,601** in view of **Turchan et al** (5,554,415) and **Bunting, et al** (5,127,923).

Pope, et al discloses a prosthetic joint having first and second members with a fixation portion and a load bearing/articulation portion. The joint includes a volume of diamond on the load bearing/articulation portion. Pope, et al discloses a prosthetic joint having first and second members with a fixation portion and a load bearing/articulation portion. The joint includes a volume of diamond on the load bearing/articulation portion. Note, Pope, et al discloses that the polycrystalline materials can be bonded to the substrate according to known methods as seen in prior patents 3745623, 3767371, 3871840, 3841852, 3913280, 4311490 where it is known to use solvent catalyst in bonding application of the polycrystalline to the substrate. Turchan, et al teaches a method for coating a substrate with PCD via sintering. Additionally, Turchan, et al provides for a transition zone and the feature of a mechanical grip. Pope, et al is silent to specific methods to achieve a PCD coating on a substrate. Pope, et al describes that the PCD layer could be bonded to the joint surfaces by any satisfactory method including different methods for different surfaces. Turchan, et al outlines various known methods to provide for a PCD layer on surgical items including sintering. Moreover, Turchan, et al describes the provision of a gradient between the substrate and the PCD and the use of mechanical grip on the substrate to provide more effective bonding of the PCD (see columns 23 and 24). Pope, et al defines the broad concept of cooperating surfaces of a prosthetic joint being provided with a coating of PCD. This coating provides excellent tribiological properties to the prosthesis. Pope, et al fails to disclose specific methods for providing the coating but states that those skilled in the art could use any known methods. Turchan, et al provides the specifics to the arrays of methods available to those skilled in the art including sintering. In light of the teachings of Turchan, et al, the joint/coating combination of Pope, et al would have been obvious to one of ordinary skill in the art based upon

engineering considerations. The specifics to the chemical bonds, mechanical grip, topographical features, stress field, Ra value, polishing, specific orthopedic structure for bone applications, materials and substrate layers are fully disclosed in the patent to Turchan, et al.

With respect to the amendment to claim 29 to include a solvent-catalyst metal, Bunting et al teaches the use of solvent-catalyst metal to aid in the process for forming a solid body. If not inherent in Pope, et al or Turchan, et al to use a solvent-catalyst metal to aid in the forming of the abrasive resistant surface would have been obvious from the teachings of Bunting et al.

With respect to claim 56, the newly added limitation to the thermal expansion of the PCD and the substrate would inherent be different, since the substrate and the PCD are materially different.

5. Claims 29-66 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over:

- (i) Claims 1-60 of U.S. Patent No. **6,398,815**;
- (ii) Claims 1-123 of U.S. Patent No. **6,425,922**;
- (iii) Claims 1-77 of U.S. Patent No. **6,517,583**;
- (iv) Claims 1-71 of U.S. Patent No. **6,610,095**;
- (v) Claims 1-37 of U.S. Patent No. **6,676,704**;
- (vi) Claims 1-24 of U.S. Patent No. **6,709,463**;
- (vii) Claims 1-43 of U.S. Patent No. **6,793,681**;
- (viii) Claims 1-43 of U.S. Patent No. **6,800,095**; and
- (ix) Claims 1-66 of U.S. Patent No. **7,077,867**.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the difference between claims 29-66 of the application and (i) Claims 1-60 of U.S. Patent No. **6,398,815**; (ii) Claims 1-123 of U.S. Patent No. **6,425,922**; (iii) Claims 1-77 of U.S. Patent No. **6,517,583**; (iv) Claims 1-71 of U.S. Patent No. **6,610,095**; (v) Claims 1-37 of U.S. Patent No. **6,676,704**; (vi) Claims 1-24 of U.S. Patent No. **6,709,463**; (vii) Claims 1-43 of U.S. Patent No. **6,793,681**; (viii) Claims 1-43 of U.S. Patent No. **6,800,095**; and (ix) Claims 1-66 of U.S. Patent No. **7,077,867** lies in the fact that the patent claims include many more elements and is thus much more specific. Thus the invention of (i) Claims 1-60 of U.S. Patent No. **6,398,815**; (ii) Claims 1-123 of U.S. Patent No. **6,425,922**; (iii) Claims 1-77 of U.S. Patent No. **6,517,583**; (iv) Claims 1-71 of U.S. Patent No. **6,610,095**; (v) Claims 1-37 of U.S. Patent No. **6,676,704**; (vi) Claims 1-24 of U.S. Patent No. **6,709,463**; (vii) Claims 1-43 of U.S. Patent No. **6,793,681**; (viii) Claims 1-43 of U.S. Patent No. **6,800,095**; and (ix) Claims 1-66 of U.S. Patent No. **7,077,867** is in effect a “species” of the “generic” invention of claims 29-66. It has been held that the generic invention is “anticipated” by the “species”. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993). Since claims 29-66 of the application are anticipated by (i) Claims 1-60 of U.S. Patent No. **6,398,815**; (ii) Claims 1-123 of U.S. Patent No. **6,425,922**; (iii) Claims 1-77 of U.S. Patent No. **6,517,583**; (iv) Claims 1-71 of U.S. Patent No. **6,610,095**; (v) Claims 1-37 of U.S. Patent No. **6,676,704**; (vi) Claims 1-24 of U.S. Patent No. **6,709,463**; (vii) Claims 1-43 of U.S. Patent No. **6,793,681**; (viii) Claims 1-43 of U.S. Patent No. **6,800,095**; and (ix) Claims 1-66 of U.S. Patent No. **7,077,867**, it is not patentably distinct from (i) Claims 1-60 of U.S. Patent No. **6,398,815**; (ii) Claims 1-123 of U.S. Patent No. **6,425,922**; (iii) Claims 1-77 of U.S. Patent No. **6,517,583**; (iv) Claims 1-71 of U.S. Patent No. **6,610,095**; (v) Claims 1-37 of U.S. Patent No.

6,676,704; (vi) Claims 1-24 of U.S. Patent No. **6,709,463; (vii)** Claims 1-43 of U.S. Patent No. **6,793,681; (viii)** Claims 1-43 of U.S. Patent No. **6,800,095; and (ix)** Claims 1-66 of U.S. Patent No. **7,077,867.**

6. Claims 29-66 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over current/pending claims of copending Application No. **10/229,907; 10/755,152; 11/435,383; and 11/435,392.**

Although the conflicting claims are not identical, they are not patentably distinct from each other because the above-indicated applications claim a prosthetic joint comprising first and second joint members/components, one of said joint members/components comprising sintered polycrystalline diamond compact located on a load bearing and articulation portion. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 29, 30, 32-45, 48-53, and 55-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Buechel et al.** (5,702,448; cited in Applicants' IDS) in view of **Frushour** (5,011,515; cited in Applicants' IDS).

Buechel et al. disclose prosthetic devices, including a knee prosthesis (see column 1, lines 13-27), with a smooth articulating surface having load bearing and articulation portions having a substrate coated with diamond, col. 10, lines 27-42 and col. 11, lines 1-4. Buechel also discloses to polish the coating, col. 8, lines 47-49 and col. 9, lines 23-25. See col. 6, lines 37-56 for metals used for the substrate. Buechel et al. additionally disclose that CoCr can be used as the metal, col. 10, lines 57-58. It is inherent that the materials have CTEs and moduli that are different since the substrate and coating are different. The coating formed on the substrate is crystalline in structure, col. 8, lines 1-2 and can be interpreted to include interstitial spaces in diamond layer since it has "pores" lines 4-6. It is also inherent that some sp³ bonds are formed in the coating process, well known in the art, i.e. sintering. However, Buechel does not explicitly disclose a transition zone is formed between the substrate and the diamond or to have substrate surface topographical features. Frushour teaches that composites of diamond joined with metal substrates used in applications requiring high abrasion resistance are attached by high temperatures and pressure, col. 1, lines 9-16. The metal substrate inherently provides a solvent-catalyst. Frushour also teaches to use irregularities in the substrate surface to increase the surface area for bonding, col. 3, lines 13-21. Frushour additionally teaches the topography can be established prior to sintering, col. 4, lines 63-67. It would have been obvious to one of ordinary skill in the art to use the method of joining diamond with a substrate and have a transition zone as taught by Frushour in the prosthesis of Buechel such that the attachment is stronger. The motivation to use Frushour's teaching to form a high impact and abrasion resistant device is that knee joints require great resistance to wear resulting from the pressures exerted on the knee prosthesis.

9. Claims 29, 30, 32-45, 48-53, and 55-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Pope et al.** (5,645,601; cited in Applicants' IDS) in view of **Turchan et al.** (5,554,415; cited in Applicants' IDS).

Pope, et al discloses a prosthetic joint (including a prosthetic knee joint) having first and second members with a fixation portion and a load bearing/articulation portion. The joint includes a volume of diamond on the load bearing/articulation portion. Note, Pope, et al discloses that the polycrystalline materials can be bonded to the substrate according to known methods as seen in prior patents 3745623,3767371,3871840,3841852,3913280,4311490 where it is known to use solvent catalyst in bonding application of the polycrystalline to the substrate. Turchan, et al teaches a method for coating a substrate with PCD via sintering. Additionally, Turchan, et al provides for a transition zone and the feature of a mechanical grip. Pope,et al is silent to specific methods to achieve a PCD coating on a substrate. Pope, et al describes that the PCD layer could be bonded to the joint surfaces by any satisfactory method including different methods for different surfaces. Turchan, et al outlines various known methods to provide for a PCD layer on surgical items including sintering. Moreover, Turchan, et al describes the provision of a gradient between the substrate and the PCD and the use of mechanical grip on the substrate to provide more effective bonding of the PCD (see columns 23 and 24). Pope, et al defines the broad concept of cooperating surfaces of a prosthetic joint being provided with a coating of PCD. This coating provides excellent tribological properties to the prosthesis. Pope, et al fails to disclose specific methods for providing the coating but states that those skilled in the art could use any known methods. Turchan, et al provides the specifics to the arrays of methods available to those skilled in the art including sintering. In light of the teachings of Turchan, et al,

the joint/coating combination of Pope, et al would have been obvious to one of ordinary skill in the art based upon engineering considerations. The specifics to the chemical bonds, mechanical grip, topographical features, stress field, Ra value, polishing, specific orthopedic structure for bone applications, materials and substrate layers are fully disclosed in the patent to Turchan, et al. The metal substrate inherently provides a solvent-catalyst.

10. Claims 29, 30, 32-42, 48-50, 52, 53, and 55-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dearnaley et al.** (United States Patent Number 5,593,719) in view of **Dennis** (United States Patent Number 5,120,327), as evidenced by **Lewin et al.** (United States Patent Number 4,486,286).

Regarding Claims 29, 56, and 57, **Dearnaley et al.** teaches a method of modifying surfaces made from metal alloy or ultra high molecular weight polyethylene (UHMWPE) for use in orthopedic implants such as the knee (1:35-45). The joint capable of being used as a knee implant includes a first joint member/hemispherical socket (1:35-45), a first joint member bone fixation portion (1:54-57), and a first joint member load bearing portion (1:55-57). **Dearnaley et al.** also teaches a second joint member/more-or-less spherical ball (1:35-40), a second joint member bone fixation portion/stem (1:50-55), and a second joint member load bearing portion (3:45-60). The second joint member load bearing portion is made of a diamond-like coating (3:55-60). A diamond-like coating inherently has similar properties to a diamond coating. The diamond-like coating is a compact/composite made from two components: 1) a substrate made of metal alloy (5:10-15) coated with silicon to create a metal-silicide interface, and 2) a table of diamond-like carbon chemically bonded to the other side of the metal-silicide interface, forming

silicon-carbide bonds (10:15-20). The table forms at least a portion of the the articulation surface. This provides a smooth and low friction load bearing surface. The metal substrate inherently provides a solvent-catalyst. However, Dearnaley et al. does not teach using a compact with actual sintered polycrystalline.

Dennis teaches a compact having polycrystalline diamond for use in cutting elements. Polycrystalline diamond is sintered to a metal (cobalt) cemented carbide (1:10-30 and 3:35-55), which is then brazed to a stud (1:10-20). The compact comprises the carbide and the polycrystalline diamond surface. The stud taught by Dennis is analogous to the joint taught by Dearnaley et al., the carbide substrate taught by Dennis is analogous to the silicon coated metal surface taught by Dearnaley et al., and the outer polycrystalline diamond surface taught by Dennis is analogous to the diamond-like carbon taught by Dearnaley et al. Dearnaley et al. and Dennis are combinable because they are concerned with the same technical difficulty, namely, providing wear-resistant surfaces at high-friction interfaces. At the time of the invention, it would have been obvious to a person having ordinary skill in the art to modify the diamond-like carbon compact on the load bearing surface of the joint taught by Dearnaley et al. with the polycrystalline diamond compact taught by Dennis, and one would have been motivated to do so because the use of real diamond would have been obvious alternative in light of the suggestion of a "diamond-like" surface as taught by Dearnaley et al. Benefits of using diamond or diamond-like materials in orthopedic applications are hardness, chemical inertness, and good insulating properties which diminish chances of clotting (Lewin et al., 1:10-35).

Regarding Claims 32, 59, and 62, the compact taught by Dearnaley et al. has chemical bonds between the diamond-like carbon table and the metal-silicon substrate (10:15-20).

Furthermore, Dennis teaches a compact comprising a cobalt-cemented carbide substrate sintered to a polycrystalline diamond table. While Dennis does not specifically mention the chemical bonds that occur between the cobalt and the diamond, they are assumed to be inherently present since the materials and process of making the compact are the same as that of the instant application (instant application, para. 0143).

Regarding Claims 33, 34, 60, and 61, the compact taught by Dennis comprises a mechanical grip between the diamond table and the substrate that is made possible by topographical features (FIG. 1).

Regarding Claim 35, the articulation surface taught by Dearnaley et al. is convex and partially spherical (1:35-40 and 3:45-55).

Regarding Claims 36 and 63, a residual stress field is inherent to a crystalline material such as the polycrystalline diamond used in Dennis. Nonetheless, Dennis also mentions a residual stress field in the compact (4:10-15).

Regarding Claims 37 and 64, different coefficients of thermal expansion are inherent to the diamond/diamond-like carbon and substrates of both Dearnaley et al. and Dennis, considering that any two different materials are going to have different expansion properties.

Regarding Claims 38 and 65, different moduli are inherent to the diamond/diamond-like carbon and substrates of both Dearnaley et al. and Dennis, considering that any two different materials are going to have different mechanical properties.

Regarding Claims 39 and 66, Dearnaley et al. teaches that the Ra value of the load bearing and articulation surface is less than 0 to 0.05 micrometers Ra (8:30-35).

Regarding Claim 40, the property of being “burnished” is inherent to both the teachings of Dearnaley et al. and Dennis, considering that they are used in high-friction environments. They become burnished with wear.

Regarding Claim 41, the “stem” and the “cup” taught by Dearnaley et al. are inherently shaped to be press fit into a receptacle formed in bone (1:45-60), and inherently have “bone mating” portions. Any surface which touches bone is considered a “bone mating” portion.

Regarding Claim 48, the metal-silicon substrate taught by Dearnaley et al. may include cobalt, titanium, tungsten, or molybdenum (5:10-15).

Regarding Claims 49 and 58, the substrate taught by Dearnaley et al. includes metal cemented carbide (the silicon carbide [SiC] bonds are cemented to the metal substrate underneath) (10:15-20). Furthermore, Dennis also teaches a metal (cobalt) cemented carbide (1:10-30 and 3:35-55). The cobalt “weeps” out of the carbide underneath to inherently form a gradient zone between the polycrystalline diamond and the substrate (3:35-55).

Regarding Claim 50, the metal silicon substrate taught by Dearnaley et al. teaches a plurality of layers (metal of the joint component, then silicon) (5:1-10). The substrate taught by Dennis also has a plurality of layers (metal of the stud, then tungsten/cobalt) (1:10-20).

Regarding Claim 52, Dennis teaches the use of varying sizes of diamond crystals (5:5-10).

Regarding Claims 53 and 55, Dearnaley et al. teaches that the first joint member has a counter bearing material, UHMWPE, against which the diamond-like carbon table articulates. UHMWPE is not as hard as the diamond-like carbon table (3:45-60).

As noted by the United States Supreme Court, if a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *KSR*, 127 S. Ct. at 1740. "When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show it was obvious under 35 U.S.C. 103." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742, 82USPQ2d 1385, 1396 (2007).

11. Claims 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dearnaley et al.** (United States Patent Number 5,593,719) in view of **Dennis** (United States Patent Number 5,120,327), as evidenced by **Lewin et al.** (United States Patent Number 4,486,286) as applied to claim 29 above, and further in view of **Kenna** (United States Patent Number 4,550,448).

Dearnaley et al. teaches the basic bone fixation/mating surfaces as applied above. However, Dearnaley et al. does describe the construction of the implant sufficiently to teach specific features of the bone mating surface on the bone fixation portions.

Kenna teaches a knee prosthesis (FIGS. 1-4) coated with metal sintered beads (FIG. 2 and abstract). This feature will inherently enhance frictional engagement with the bone as well as encourage bone ingrowth (abstract). Dearnaley et al. and Kenna are combinable because they are

from the same field of endeavor, namely, knee implants. At the time of the invention, it would have been obvious to a person having ordinary skill in the art to modify the bone fixation surfaces of the implant taught by Dearnaley et al. with the sintered metal beads as taught by Kenna, and one would have been motivated to do so in order to lock the prosthesis in place (Kenna, 1:10-15).

Response to Arguments

12. Regarding the 103(a) rejection based on **Dearnaley et al.** (United States Patent Number 5,593,719) in view of **Dennis** (United States Patent Number 5,120,327), as evidenced by **Lewin et al.** (United States Patent Number 4,486,286), Applicants' arguments filed June 13, 2008 have been fully considered but they are not persuasive.

a. A diamond-like coating inherently has similar properties to a diamond coating. The diamond-like coating is a compact/composite made from two components: 1) a substrate made of metal alloy (5:10-15) coated with silicon to create a metal-silicide interface, and 2) a table of diamond-like carbon chemically bonded to the other side of the metal-silicide interface, forming silicon-carbide bonds (10:15-20). The table forms at least a portion of the articulation surface. This provides a smooth and low friction load bearing surface. Further, the "deficiencies" from Dearnaley et al. '719 are met and provided by Dennis '327 and Lewin et al. '286. The combination is proper.

b. In response to Applicants' piecemeal analysis of the references, it has been held that one cannot show nonobviousness by attacking references individually where, as here, the rejections are based on combinations of references. *In re Keller*, 208 USPQ 871 (CCPA 1981).

c. In response to Applicant's argument that there is no suggestion to combine the references, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971).

d. As noted by the United States Supreme Court, if a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *KSR*, 127 S. Ct. at 1740. "When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product is not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show it was obvious under 35 U.S.C. 103." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742, 82USPQ2d 1385, 1396 (2007).

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javier G. Blanco whose telephone number is 571-272-4747. The examiner can normally be reached on M-F (9:00 a.m.-7:00 p.m.), first Friday of the bi-week off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Isabella can be reached on **(571)272-4749**. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300 for regular communications and After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0858.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Javier G. Blanco/

Examiner, Art Unit 3774

/David H Willse/

Primary Examiner, Art Unit 3738